

CLAIMS

What is claimed is:

1 1. A method of detecting a predisposition to cancer in an animal, said
2 method comprising:
3 (i) providing a biological sample from said animal;
4 (ii) detecting the level of a gene of Figure 1 or Figure 2 within said
5 biological sample; and
6 (iii) comparing said level of said gene with a level of said gene in a
7 control sample taken from a normal, cancer-free tissue;
8 wherein an increased level of the gene of Figure 1 or a decreased level of the gene of Figure
9 2 in said biological sample compared to the level of said gene in said control sample
10 indicates a predisposition to cancer in said animal.

1 2. The method of claim 1, wherein said level of said gene is detected by
2 determining the copy number of genes in the cells of said biological sample.

1 3. The method of claim 2, wherein said copy number is measured using
2 Comparative Genomic Hybridization (CGH).

1 4. The method of claim 1, wherein said copy number is determined by
2 hybridization to an array of nucleic acid probes.

1 5. The method of claim 3, wherein said Comparative Genomic
2 Hybridization is performed on an array.

1 6 The method of claim 1, wherein said level of said gene is detected by
2 measuring the level of said gene mRNA in said biological sample, wherein an increased
3 level of said gene of Figure 1 or decreased level of said gene of Figure 2 RNA in said
4 sample compared to RNA in said control sample indicates a predisposition to cancer.

1 7. The method of claim 6, wherein said level of mRNA is measured in
2 said biological sample and said control sample at the same time.

1 8. The method of claim 6, wherein said level of mRNA is measured by
2 hybridization to one or more probes on an array.

1 9. The method of claim 1, wherein said level of a gene of Figure 1 or
2 Figure 2 is detected by measuring the level of the gene product of said gene in said
3 biological sample, wherein an increased level of said product of the gene of Figure 1 or a
4 decreased level of said product of the gene of Figure 2 in said sample as compared to said
5 gene product in said control sample indicates a predisposition to cancer.

1 10. The method of claim 9, wherein the level of said gene product is
2 measured in the biological sample and the control sample at the same time.

1 11. The method of claim 1, wherein said animal is a mammal selected
2 from the group consisting of humans, non-human primates, canines, felines, murines,
3 bovines, equines, porcines, and lagomorphs.

1 12. The method of claim 1, wherein said biological sample is selected
2 from the group consisting of excised tissue, whole blood, serum, plasma, buccal scrape,
3 saliva, cerebrospinal fluid, and urine.

1 13. The method of claim 1, wherein the difference between said increased
2 level of the gene of Figure 1 or said decreased level of the gene of Figure 2 in said biological
3 sample and the level of said gene in said control sample is a statistically significant
4 difference.

1 14. The method of claim 1, wherein said increased level of the gene of
2 Figure 1 or decreased level of the gene of Figure 2 in said biological sample is at least about
3 2-fold greater or lesser than the level of said gene in said control sample.

1 15. The method of claim 1, wherein said increased level of the gene of Figure 1 or
2 decreased level of the gene of Figure 2 in said biological sample is at least about 4-fold
3 greater or lesser than the level of said gene in said control sample.

1 16. A method of estimating the survival expectancy of an animal, said method
2 comprising:

3 (i) providing a biological sample from said animal;

8 (ii) detecting the level of a gene of Figure 1 or Figure 2 within said biological
9 sample; and

10 (iii) comparing said level of said gene with a level of said gene in a control sample
11 taken from a normal, cancer-free tissue;
12 wherein an increased level of the gene of Figure 1 or a decreased level of the gene of Figure
13 2 in said biological sample compared to the level of said gene in said control sample
14 indicates a reduced survival expectancy in said animal compared to an animal with cancer
15 that has a normal level of said gene.

1 17. The method of claim 16, wherein said level of said gene is detected by
2 determining the copy number of said genes in the cells of said animal.

1 18. The method of claim 17, wherein said copy number is determined by
2 hybridization to an array of nucleic acid probes.

1 19. The method of claim 17, wherein said copy number is measured using
2 Comparative Genomic Hybridization.

1 20. The method of claim 19, wherein said Comparative Genomic
2 Hybridization is performed on an array.

1 21. The method of claim 16, wherein said level of said gene is detected by
2 measuring the level of said gene mRNA in said biological sample, wherein an increased
3 level of RNA of the gene of Figure 1 or decreased level of the RNA of the gene of Figure 2
4 in said sample as compared to RNA in said control sample indicates a reduced survival
5 expectancy.

1 22. The method of claim 1, wherein said level of mRNA is measured in
2 said biological sample and said control sample at the same time.

1 23. The method of claim 16, wherein said level of said gene is detected by
2 measuring the level of the gene product of said gene in said biological sample, wherein an
3 increased level of the gene product of a gene of Figure 1 or decreased level of the gene
4 product of a gene of Figure 2 in said sample as compared to said gene said control sample
5 indicates a reduced survival expectancy.

1 24. The method of claim 16, wherein said animal is a mammal selected
2 from the group consisting of humans, non-human primates, canines, felines, murines,
3 bovines, equines, porcines, and lagomorphs.

1 25. The method of claim 16, wherein said biological sample is selected
2 from the group consisting of excised tissue, whole blood, serum, plasma, buccal scrape,
3 saliva, cerebrospinal fluid, and urine.

1 26. The method of claim 16, wherein the difference between said level of
2 said gene in said biological sample and the level of said gene in said control sample is a
3 statistically significant difference.

1 27. The method of claim 16, wherein said increased level of said gene of
2 Figure 1 or said decreased level of said gene of Figure 2 in said biological sample is at least
3 about 2-fold different than the level of said gene in said control sample.

1 28. The method of claim 16, wherein said increased level of said gene of
2 Figure 1 or said decreased level of said gene of Figure 2 in said biological sample is at least
3 about 4-fold different than the level of said gene in said control sample.

1 29. A method of treating cancer in an animal, said method comprising:
2 (i) providing a biological sample from said animal;
3 (ii) detecting the level of a gene of Figure 1 or Figure 2 within said
4 biological sample;
5 (iii) comparing said level of said gene with a level of said gene in a
6 control sample taken from a normal, cancer-free tissue; and
7 (iv) selecting and performing a cancer therapy in those animals having
8 an increased level of said gene of Figure 1 or a decreased level of said gene of Figure 2
9 compared to the level of said gene in said control sample.

1 11. The method of claim 29, wherein said cancer therapy is selected from
2 the group consisting of chemotherapy, radiation therapy, surgery, antihormone therapy, and
3 immunotherapy.

1 31. The method of claim 29, wherein said cancer therapy is an adjuvant
2 cancer therapy.

1 32. The method of claim 29, wherein said level of said gene is detected by
2 determining the copy number of genes in the cells of said animal.

1 33. The method of claim 32, wherein said copy number of genes is
2 determined by hybridization to an array of nucleic acid probes.

1 34. The method of claim 32, wherein said copy number of said genes is
2 measured using Comparative Genomic Hybridization (CGH).

1 35. The method of claim 34, wherein said Comparative Genomic
2 Hybridization is performed on an array.

1 36. The method of claim 29, wherein said level of said gene is detected by
2 measuring the levels of said gene mRNA in said biological sample, wherein an increased
3 level of said gene of Figure 1 or a decreased level of said gene of Figure 2 RNA in said
4 sample as compared to said gene RNA in said control sample indicates the need for an
5 adjuvant cancer therapy.

1 37. The method of claim 36, wherein said level of said gene RNA is
2 measured in said biological sample and said control sample at the same time.

1 38. The method of claim 29, wherein said level of said gene is detected by
2 measuring the level of the product of said gene in said biological sample, wherein an
3 increased level of the product of said gene of Figure 1 or a decreased level of the product of
4 said gene of Figure 2 in said sample as compared to said gene product in said control sample
5 indicates the need for an adjuvant cancer therapy.

1 39. The method of claim 29, wherein said animal is a mammal selected
2 from the group consisting of humans, non-human primates, canines, felines, murines,
3 bovines, equines, porcines, and lagomorphs.

1 40. The method of claim 29, wherein said biological sample is selected
2 from the group consisting of excised tissue, whole blood, serum, plasma, cerebrospinal fluid,
3 buccal scrape, saliva, and urine.

1 41. The method of claim 29, wherein the difference between said
2 increased level of said gene in said biological sample and the level of said gene in said
3 control sample is a statistically significant difference.

1 42. The method of claim 29, wherein said increased level of said gene in
2 said biological sample is at least about 2-fold different than the level of said gene in said
3 control sample.

1 43. The method of claim 29, wherein said level of said gene in said
2 biological sample is at least about 4-fold different than the level of said gene in said control
3 sample.

1 44. A method of screening a test agent for the ability to inhibit
2 proliferation of a cell expressing a gene of Figure 1 or Figure 2, said method comprising:
3 (i) contacting said cell with said test agent; and
4 (ii) detecting the level of said gene activity;
5 wherein a decreased level of activity of a gene of Figure 1 or an increased level of activity of
6 a gene of Figure 2 as compared to the level of gene activity in a cell not contacted with said
7 agent indicates that said agent inhibits proliferation of said cell.

1 45. The method of claim 44, wherein said detecting comprises detecting
2 the level of a product of said gene wherein a decreased level of said product of said gene of
3 Figure 1 or an increased level of said product of said gene of Figure 2 in said cell as
4 compared to the gene product level in a cell not contacted with said agent sample indicates
5 that said agent inhibits proliferation of said cell.

1 46. The method of claim 44, wherein said cell is a tumor cell.

1 47. The method of claim 44, wherein said cell is a hyperproliferative cell.

1 48. The method of claim 44, wherein the difference between said gene
2 activity and the level of said gene activity activity in a cell not contacted with said agent is a
3 statistically significant difference.

1 49. The method of claim 44, wherein said level of gene activity is at least
2 about 2-fold different than the level of gene activity in a cell not contacted with said agent.

1 50. The method of claim 44, wherein said level of said gene activity is at
2 least about 4-fold different than the level of said gene activity in a cell not contacted with
3 said agent.

1 51 A method of decreasing the proliferation of a cell with an elevated
2 level of a gene of Figure 1, said method comprising reducing the level of said gene activity
3 in said cell using an inhibitor of said gene.

1 52. The method of claim 51, wherein said cell is a hyperproliferative cell.

1 53. The method of claim 51, wherein said cell is a metastatic cell.

1 54. The method of claim 51, wherein said inhibitor is selected from the
2 group consisting of antisense oligonucleotides, ribozymes, and repressors of said gene.